

## Solve with Substitution

$$\textcircled{1} \begin{cases} y = 2x + 1 \\ y = 4x + 5 \end{cases}$$

$$\textcircled{2} \begin{cases} y = 3x - 5 \\ 2y = 6x + 4 \end{cases}$$

$$\textcircled{3} \begin{cases} 4x + 3y = 12 \\ x = 5y - 20 \end{cases}$$

## Solve with Elimination

$$\textcircled{4} \begin{cases} 12x + 3y = -9 \\ 4x + y = -3 \end{cases}$$

$$\textcircled{5} \begin{cases} 4x - y = 6 \\ -2x + 3y = 12 \end{cases}$$

$$\textcircled{6} \begin{cases} 2x + 3y = 4 \\ 3x + 5y = 7 \end{cases}$$

Graph The feasible region and minimize/maximize

$$\textcircled{7} \quad \begin{cases} x \geq 2 \\ y \geq 0 \\ 3x + 2y \geq 12 \end{cases}$$

minimize for

$$C = 4x + y$$

$$\textcircled{8} \quad \begin{cases} 3x + 2y \leq 12 \\ x + y \leq 5 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

maximize for

$$P = 3x + 5y$$



⑨ Kevin's dog Amadeus likes two kinds of dog food.

"Gourmet Dog" costs 40 cents a can and has 20 units of vitamin complex and a calorie content of 25 calories. "Chow Hound" costs 32 cents a can and has 35 units of vitamin complex and 50 calories.

Amadeus needs at least 1175 units of vitamin complex and at least 2375 ~~units~~ calories a month. Kevin has space to store up to 60 cans of dog food at a time. How much of each kind of food should Kevin buy each month to minimize his cost?

①  $(-2, -3)$

② No Solution, inconsistent, parallel

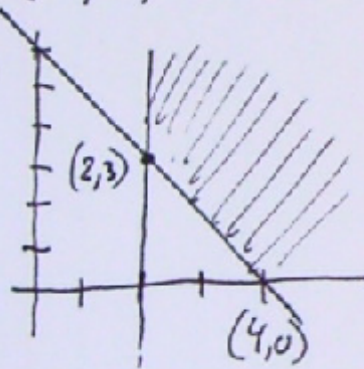
③  $(0, 4)$

④ All  $\mathbb{R}$ , dependent, same line

⑤  $(3, 6)$

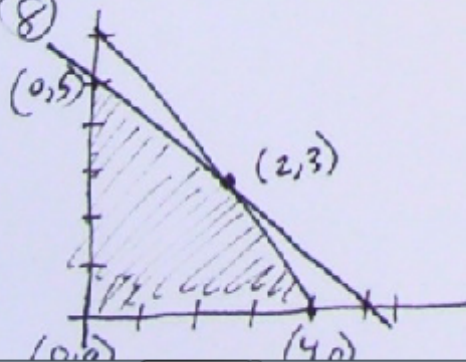
⑥  $(-1, 2)$

⑦



$C = 11$  at  $(2, 3)$

⑧



$P = 25$  at  $(0, 5)$



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$$G.D = x \quad C.H. = y \quad C = 0.40x + 0.32y$$

$$20x + 35y \geq 1175 \quad x\text{-int} = 58.75 \quad y\text{-int} = 33.6$$

$$25x + 50y \geq 2375 \quad x\text{-int} = 95 \quad y\text{-int} = 47$$

$$x + y \leq 60 \quad x\text{-int} = 60 \quad y\text{-int} = 60$$

$$25x + 50y = 2375$$

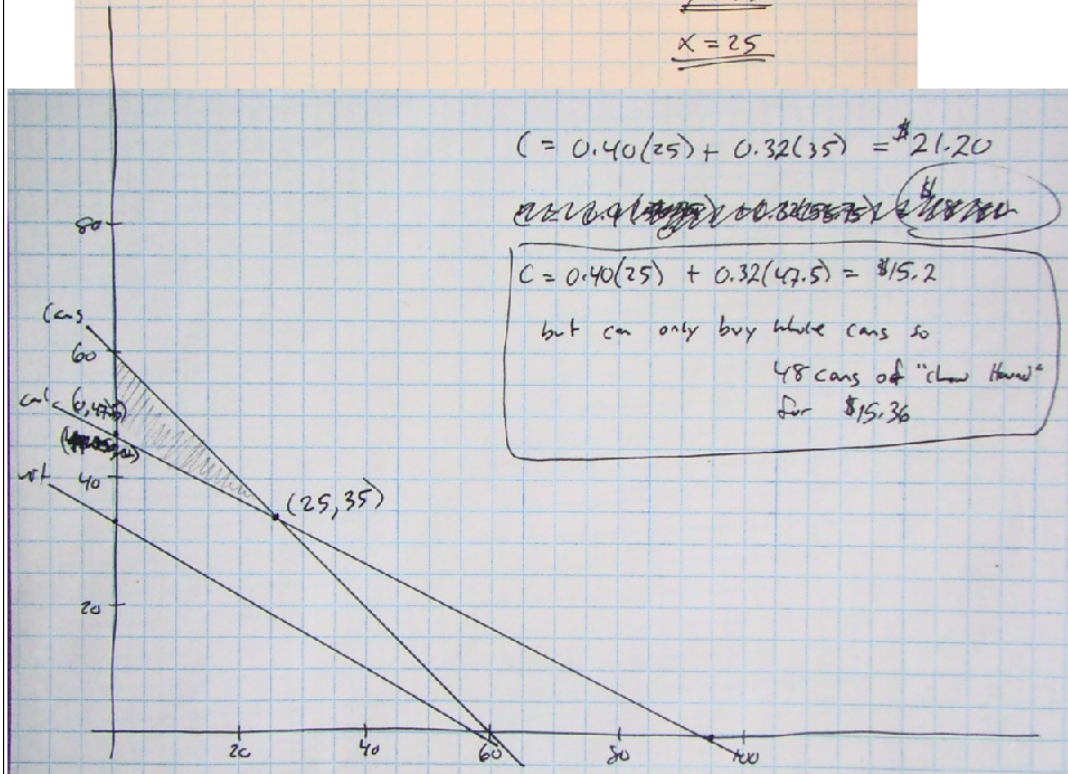
$$x + y = 60$$

$$\begin{array}{r} 25x + 50y = 2375 \\ - 25x + 25y = 1500 \\ \hline \end{array}$$

$$25y = 875$$

$$y = 35$$

$$x = 25$$



**Dietary Requirements** A certain diet requires at least 60 units of carbohydrates, 45 units of protein, and 30 units of fat each day. Each ounce of Supplement A provides 5 units of carbohydrates, 3 units of protein, and 4 units of fat. Each ounce of Supplement B provides 2 units of carbohydrates, 2 units of protein, and 1 unit of fat. If Supplement A costs \$1.50 per ounce and Supplement B costs \$1.00 per ounce, how many ounces of each supplement should be taken daily to minimize the cost of the diet?

$$\text{Supp A} = x$$

$$\text{Supp B} = y$$

	<sup>x</sup> Supp A		<sup>y</sup> Supp B		Total		
Carbs	5x	+	2y	≥	60	x-int = 12	y-int = 30
Protein	3x	+	2y	≥	45	x-int = 15	y-int = 22.5
Fat	4x	+	1y	≥	30	x-int = 7.5	y-int = 30



